



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/870,926 | 05/30/2001 | Abraham Krieger | 01827.0050.00US00 | 8699 |

46903 7590 07/27/2005

HOWREY LLP
C/O IP DOCKETING DEPARTMENT
2941 FAIRVIEW PARK DRIVE SUITE 200
FALLS CHURCH, VA 22042-2924

EXAMINER

ODOM, CURTIS B

ART UNIT PAPER NUMBER

2634

DATE MAILED: 07/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/870,926

Applicant(s)

KRIEGER ET AL.

Examiner

Curtis B. Odom

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11-14, 18-28, 34-38 and 41-49 is/are rejected.
- 7) ☒ Claim(s) 6-12, 15-17, 29-35, 39 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: On page 10, lines 24-25, the application number is suggested to be completed.

Appropriate correction is required.

Claim Objections

2. Claims 1-49 objected to because of the following informalities:

- a. In claims 1, 13, 18, 19, 24, 36, 41, and 42, "SNR" is suggested to be changed to "signal-to-noise ration (SNR)".
- b. In claims 3, 4, 15, 17, 26, 27, 38, and 40, E_s and N_0 are suggested to be defined.
- c. In claims 9 and 11 the phrase "the second table" is suggested to be changed to "a second table".
- d. In claims 48 and 49, "ASIC" is suggested to be changed to "application-specific integrated circuit (ASIC)".

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 5, 18, 24, 25, 28, 41, 46, and 47 are rejected under 35 U.S.C. 102(e) as being anticipated by Fargues et al. (U. S. Patent No. 6, 108, 373).

Regarding claim 1, Fargues et al. discloses a system for estimating an SNR-related parameter comprising:

first logic (Fig. 6, block 64, column 4, lines 49-column 6, line 25) for determining a count of the number of received symbols in a predetermined number of received symbols that fall within one or more predetermined sample collection areas (Fig. 3 and Fig. 4); and;

second logic (Fig. 6, block 63, column 6, lines 3-25) for associating the count with a value of the SNR-related parameter.

Regarding claim 2, which inherits the limitations of claim 1, Fargues disclose the symbols are quadrature symbols having in-phase (I) and quadrature (Q) components (column 3, lines 44-55), the one or more collection areas are defined in relation to an I-Q plane, and the first logic determines if a received symbol falls into the one or more collection areas from the I and Q components of the symbol (Fig 3 and Fig. 4).

Regarding claim 5, which inherits the limitations of claim 1, Fargues et al. discloses the second logic associates the count with a value of the SNR-related parameter using one or more lookup tables (Fig. 6, block 61, column 6, lines 12-16)

Regarding claim 18, Fargues et al. discloses a system for estimating an SNR-related parameter comprising:

first means (Fig. 6, block 64, column 4, lines 49-column 6, line 25) for determining a count of the number of received symbols in a predetermined number of received symbols that fall within one or more predetermined sample collection areas (Fig. 3 and Fig.4); and;

second means for (Fig. 6, block 63, column 6, lines 3-25) for associating the count with a value of the SNR-related parameter.

Regarding claim 24, Fargues et al. discloses a method for estimating an SNR-related parameter comprising:

determining (Fig. 6, block 64, column 4, lines 49-column 6, line 25) a count of the number of received symbols in a predetermined number of received symbols that fall within one or more predetermined sample collection areas (Fig. 3 and Fig.4); and;

correlating (Fig. 6, block 63, column 6, lines 3-25) the count with a value of the SNR-related parameter.

Regarding claim 25, which inherits the limitations of claim 24, Fargues disclose the symbols are quadrature symbols having in-phase (I) and quadrature (Q) components (column 3, lines 44-55), the one or more collection areas are defined in relation to an I-Q plane, and the determining step comprises determining if a received symbol falls into the one or more collection areas from the I and Q components of the symbol (Fig 3 and Fig. 4).

Regarding claim 28, which inherits the limitations of claim 24, Fargues et al. discloses associating the count with a value of the SNR-related parameter using one or more lookup tables (Fig. 6, block 61, column 6, lines 12-16)

Regarding claim 41, Fargues et al. discloses a method for estimating an SNR-related parameter comprising:

a step for determining (Fig. 6, block 64, column 4, lines 49-column 6, line 25) a count of the number of received symbols in a predetermined number of received symbols that fall within one or more predetermined sample collection areas (Fig. 3 and Fig.4); and;

a step for associating (Fig. 6, block 63, column 6, lines 3-25) the count with a value of the SNR-related parameter.

Regarding claims 46 and 47, which inherit the limitations of claim 24, Fargues et al. discloses a state machine (Fig. 6, block 64), a memory (Fig. 6, block 61), and one or more arithmetic elements (Fig. 6, block 63). wherein the state machine provides control, one or more lookup tables are stored in the memory and the one or more arithmetic elements perform arithmetic operations for scaling or interpolation (column 5, line 1-column 6, line 25).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 4, 26, 27, 44, 45, 48, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fargues et al. (U. S. Patent No. 6, 108, 373).

Regarding claims 3, 4, 26, and 27, Fargues et al. discloses the SNR-related parameter is E_B/N_0 which can be expressed in Watts or dB (column 4, lines 37-56). Fargues et al. does not disclose the SNR related parameter is E_S/N_0 expressed in dB. However, it would have been obvious to one skilled in the art at the time the invention was made that E_S/N_0 is simply E_B/N_0 divided by the number of bits per symbol. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made that since E_S/N_0 is directly proportional to E_B/N_0 which can also be expressed in dB that the SNR-related parameter of Fargues et al. could have been expressed as E_S/N_0 in dB without changing the functionality of the device. Thus, claims 3, 4, 26, and 27 do not constitute patentability.

Regarding claims 44 and 45, which inherit the limitations of claim 24, Fargues et al. does not disclose the method of claim 24 stored as a series of instructions on a processor readable medium including a processor configured to access and execute the series of instructions. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement the method of Fargues et al. as software in order to reduce cost and improve the adaptability and flexibility of the system.

Regarding claims 48 and 49, Fargues et al. does not disclose the state machine (counter) is comprised of one or more ASICs and the ASIC are synthesized logic. However, it would have been obvious to one skilled in the art at the time the invention was made that the state machine (counter) of Fargues et al. could have included application-specific integrated circuits (ASIC) with synthesized logic to

Art Unit: 2634

perform the functions as disclosed by Fargues et al. The circuits would increase flexibility of the functions of the counter. Thus, including ASICs in a device does not constitute patentability.

7. Claims 13, 14, 19-23, 36, 37, 42, and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fargues et al. (U. S. Patent No. 6, 108, 373) in view of Schulist et al. (U. S. Patent No. 6, 542, 558).

Regarding claim 13, Fargues et al. discloses a system for estimating an SNR-related parameter comprising:

first logic (Fig. 6, block 64, column 4, lines 49-column 6, line 25) for determining a count of the number of received symbols in a predetermined number of received symbols that fall within one or more predetermined sample collection areas (Fig. 3 and Fig. 4); and;

second logic (Fig. 6, block 63, column 6, lines 3-25) for correlating the count with a value of the SNR-related parameter.

Fargues et al. does not disclose a third logic for scaling a symbol with a scaling factor derived from the value of the SNR-related parameter.

Schulist et al. discloses scaling a signal with a scaling factor derived from the value of an SNR-related parameter (column 7, lines 19-58). Schulist et al. further states that scaling the signal with a scaling factor derived from a SNR would allow a decoder to achieve optimum performance results when processing the scaled signal (column 7, lines 19-58). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Fargues et al. with the scaling factor as taught by Schulist et al. in order to

Art Unit: 2634

scale symbols in order to achieve optimum performance results from the remaining devices while processing the scaled signal.

Regarding claim 14, which inherits the limitations of claim 13, Schulist et al. further discloses a fourth logic from quantizing the scaled symbol (column 7, lines 19-58), wherein turbo decoders comprise quantizers.

Regarding claim 19, Fargues et al. discloses a system for estimating an SNR-related parameter comprising:

first means (Fig. 6, block 64, column 4, lines 49-column 6, line 25) for determining a count of the number of received symbols in a predetermined number of received symbols that fall within one or more predetermined sample collection areas (Fig. 3 and Fig.4); and;

second means (Fig. 6, block 63, column 6, lines 3-25) for associating the count with a value of the SNR-related parameter.

Fargues et al. does not disclose a third means for scaling a symbol with a scaling factor derived from the value of the SNR-related parameter.

Schulist et al. discloses scaling a signal with a scaling factor derived from the value of an SNR-related parameter (column 7, lines 19-58). Schulist et al. further states that scaling the signal with a scaling factor derived from a SNR would allow a decoder to achieve optimum performance results when processing the scaled signal (column 7, lines 19-58). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device of Fargues et al. with the scaling factor as taught by Schulist et al. in order to scale symbols in order to achieve optimum performance results from the remaining devices while processing the scaled signal.

Art Unit: 2634

Regarding claim 20, which inherits the limitations of claim 19, Schulist et al. further discloses a fourth means for quantizing the scaled symbol (column 7, lines 19-58), wherein turbo decoders comprise quantizers.

Regarding claim 21, which inherits the limitations of claim 19, Schulist et al. further discloses a decoder (column 7, lines 19-58). It would have been obvious to one of ordinary skill in the art at the time the invention was made that the system disclosed by Fargues et al. and Schulist et al. could have been implemented into a second system such as a receiver system without changing the functionality of the device.

Regarding claim 22, which inherits the limitations of claim 21, Fargues et al. and Schulist et al. do not disclose the decoder comprise a log-Map decoder. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that turbo decoders can utilize log-Map algorithms, thus making the turbo decoder a log-Map decoder. Thus, claim 22 does not constitute patentability.

Regarding claim 23, which inherits the limitations of claim 22, Fargues et al. and Schulist et al. do not disclose a second system (receiver system) implemented as one or more integrated circuit chips. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that systems such as receiver systems are implemented into integrated circuit chips to take advantage of the low cost and efficiency (size and implementation) of the chip. Thus, implementing systems as integrated circuit chips does not constitute patentability.

Regarding claims 36 and 37, the claimed method includes features corresponding to subject matter mentioned in the above rejection of claims 19 and 20, which is applicable hereto.

Art Unit: 2634

Regarding claims 42 and 43, the claimed method includes features corresponding to subject matter mentioned in the above rejection of claims 19 and 20, which is applicable hereto.

Allowable Subject Matter

8. Claims 6-12, 15-17, 29-35, 39 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Xu (U. S. Patent No. 6, 829, 313) discloses log-MAP decoding in a turbo decoder.

Yagyu (U. S. Patent No. 6, 591, 390) discloses quantization in a turbo decoder.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 571-272-3046. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2634

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Curtis Odom
July 11, 2005



STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600